ELECTRIC MOBILITY
STRATEGY FOR BURLINGTON

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Burlington Green

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City of Burlington

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The Team

The Electric Mobility Strategy for Burlington was developed through a partnership between the City of Burlington and BurlingtonGreen Environmental Association. The partnership builds on the successful model of a municipal government working with a grass roots community organization to create a strategy that is reflective of the community it represents and addresses its needs. The strategy development process was informed by input and feedback from community and industry stakeholders in addition to various City departments.

The City of Burlington

Burlington as we know it today is rich in history and modern traditions of many First Nations and the Métis. From the Anishinaabeg to the Haudenosaunee, and the Métis – our lands spanning from Lake Ontario to the Niagara Escarpment are steeped in Indigenous history. The territory is mutually covered by the Dish with One Spoon Wampum Belt Covenant, an agreement between the Iroquois Confederacy, the Ojibway and other allied Nations to peaceably share and care for the resources around the Great Lakes. We would like to acknowledge that the land on which we gather is part of the Treaty Lands and Territory of the Mississaugas of the Credit.

The City of Burlington covers 186 km^2 at the northwestern end of Lake Ontario, and is located within the Regional Municipality of Halton, at the western end of the Greater Toronto Area, and the intensively developed Greater Golden Horseshoe area of Southern Ontario. There is a firm urban rural boundary protected in the City's Official Plan with the rural area protected by the provincial Greenbelt Act. The Niagara Escarpment also crosses through the northern part of Burlington, and is a designated UNESCO world biosphere reserve.

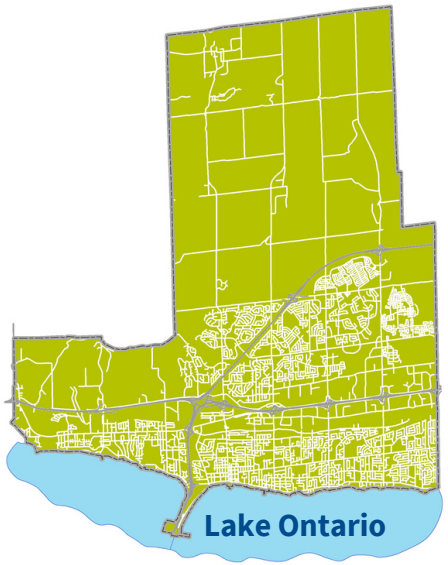


Fig 1: City of Burlington, ON

The Team

BurlingtonGreen Environmental Organization

Established in 2007, BurlingtonGreen is a community-based, non-partisan, registered charity. Through awareness, advocacy and action initiatives, BurlingtonGreen works with all sectors of the community to protect the environment, mitigate climate change and create a healthier, more environmentally responsible Burlington.

The advancement of smart communities is a key environmental priority in BurlingtonGreen's Strategic Plan[1], to support the transition of Burlington to a low carbon and sustainable community. The organization's focus on low carbon transportation started in 2014 through the Greenprint for the Future community engagement program. BurlingtonGreen's popular Make the Switch [2] program implements a holistic approach to promote "think outside the car" modes of transportation such as walking, cycling, transit and supports a shift to electric mobility. Additionally, BurlingtonGreen encouraged higher youth transit ridership through the Burlington Youth Transit Ambassador program that was established with the City's transit department.

Over the years, BurlingtonGreen has been successful at engaging the community and creating awareness campaigns that address the community's barriers to higher adoption of sustainable transportation modes and reflect their transportation habits and needs.

Acknowledgements

The Electric Mobility Strategy Advisory Committee

This work would not have been possible without the support and input of various partners and organizations that serve on the Burlington Electric Mobility Strategy Advisory Committee. Committee members represent different community and municipal partners, City Hall departments, and Burlington residents. The strategy recommendations were also informed by feedback from the EV supply chain.

Funding Support

The City of Burlington would like to acknowledge funding support for the Electric Mobility Strategy provided by the Government of Ontario.

"It is so much better than you can ever imagine. Don't hesitate. We're waiting for you!"

- Share your EV Story participant

Executive Summary

Switching personal use vehicles to electric is one of the major opportunities for greenhouse gas (GHG) reductions in Burlington and directly supports the City's Climate Action Plan[3] goal of community carbon neutrality by 2050. The transportation sector currently represents over 40% of GHG emissions in Burlington, signalling a strong need to accelerate the shift to sustainable modes of transportation to reduce the City's overall emissions profile.

A seamless transition to electric mobility in the community will be driven by a focus on driver experience, easy access to charging and the availability of electric mobility resources and information in the community. An understanding of the community's transportation needs and preferences is critical to developing an effective Electric Mobility Strategy to accelerate the transition.

Executive Summary

The Electric Mobility Strategy for Burlington will support higher uptake of electric mobility in the community through the implementation of four key action areas:

1.Charging Infrastructure and Grid Capacity: Growing residential and workplace charging capacity and expanding the public charging network, while working to ensure the grid's capacity to support increased electric mobility uptake.

2.City Leadership: Leading by example through fleet electrification, advocating to other levels of government to develop and implement policies that advance electric mobility and support the local EV and e-micro mobility market.

3.Education and Awareness: Providing opportunities and resources for the community to learn about EVs and other electric micro mobility options, in addition to electric charging technology.

4.Equity and Accessibility: Working with community partners to ensure equitable access to charging infrastructure and supporting higher electric mobility uptake in underrepresented communities.

Climate Action in Burlington

In response to the escalating climate crisis, Burlington City Council declared a climate emergency in April 2019, for the purposes of deepening the City's commitment to protecting our economy, environment and community from climate change, and committed to applying a climate lens to City operations, plans and strategies, including the budget.

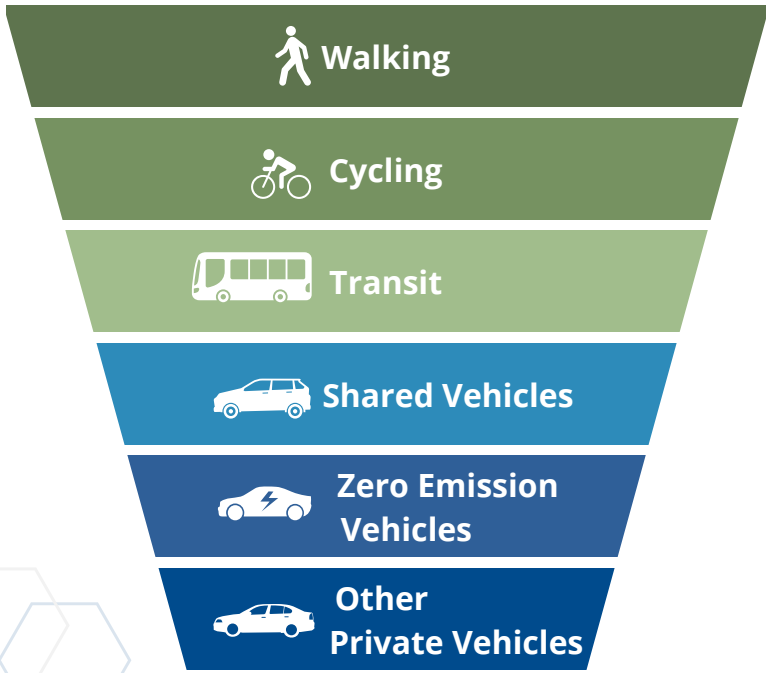
The City has shown leadership with respect to plans to mitigate and adapt to climate change. Burlington City Council approved the Corporate Energy and Emissions Management Plan in 2019 with a target for City operations, including fleet and facilities, to be net carbon neutral by 2040. The community Climate Action Plan was approved in 2020, which identifies seven program areas of focus to reduce greenhouse gas emissions to achieve the 2050 net carbon neutrality target. The implementation of measures and policies to support electric mobility options in Burlington is one of the key areas to help reduce emissions from the transportation sector; the largest source of greenhouse gas emissions in Burlington.

The community is not immune to the impacts of climate change and has already felt the effects over the past several years. In 2021 a Climate Projections report was completed for Burlington, illustrating how local climate has and is projected to change. Extreme weather events and changing climate conditions are expected to increase in frequency and severity and have damaging impacts across the city's built, natural, social and economic elements. To build on actions already in progress, City Council approved its first climate adaptation plan, Climate Resilient Burlington – A Plan for Adapting to Our Warmer, Wetter and Wilder Weather, in July 2022.

It is recognized that the transportation system, which has prioritized the use of vehicles over other modes of transportation, will need to be restructured to provide residents with more mobility options that prioritize active, public and shared transportation modes. The City is in the final stages of developing its first Integrated Mobility Plan[4], with a focus on moving people. The plan will guide how people will move in and through the community for years to come. A compendium Cycling Plan was endorsed by City Council in 2021 which will support the implementation of the Integrated Mobility Plan.

And with Burlington's higher than average car ownership culture, the shift from Internal Combustion Engine (ICE) vehicles towards EVs is a complementary priority in order to reduce emissions and achieve the identified carbon reduction targets. Shifting the modal split to support the adoption of a myriad of sustainable transportation options also remains a priority.

Fig 2: Transportation Modes Hierarchy



Objectives

The Electric Mobility Strategy for Burlington supports the Climate Action Plan's vehicle electrification milestones of 50% of total vehicles by 2030 and 100% by 2050. The electrification milestone for new vehicles is 100% by 2050[5].

This will be achieved by:

Expanding access to public and private electric charging.
Increasing awareness and support for EVs and electric micro mobility options such as e-bikes and e-scooters.
Building an "EV supportive" policy framework.
Supporting an equitable transition to electric mobility in the community.

Horizon

The implementation of the Electric Mobility Strategy is five years and consists of short and mid-term actions. Long-term recommendations are also provided to further advance electric-mobility adoption in Burlington.

Scope

The Electric Mobility Strategy focuses on light duty vehicles and e-micro mobility options such as e-bicycles and e-scooters. Out of scope for this project are heavy duty vehicles and transit buses. Some actions relate to the City fleet to be considered through the development of a new Green Fleet Strategy for City operations. The City is also working with CUTRIC[6] to assess the feasibility of zero emission buses.

In Scope	Out of Scope
Light duty personal vehicles	Transit
City fleet and equipment	Commercial vehicles
E-bikes and E-Scooters	Heavy duty vehicles

Strategic Alignment

The Electric Mobility Strategy for Burlington supports the Burlington Climate Action Plan goal of community carbon neutrality by 2050. The goals, targets and scope of this work are informed by overarching City plans and documents including:

- Vision 2040 (Burlington's Strategic Plan)
- From Vision to Focus
- Burlington Climate Action Plan
- The Integrated Mobility Plan (under development)

Other supporting plans and documents include the Climate Resilient Burlington plan, the Corporate Energy Emissions & Management Plan, and the Green Fleet Strategy (for City operations – under development).

What is Electric Mobility?

Electric mobility refers to vehicles and other e-micro mobility options that use electricity (from an external charging source) to fuel the movement of the vehicle either in whole or in part. Specifically, this means light-duty plug-in hybrid electric vehicles (PHEV) and battery electric vehicles (BEV).

Types of Electric Vehicles and E-Micro Mobility Options		
	Battery Electric Vehicle	Runs on an electric motor powered by electricity from an external electric source. The vehicle must be plugged into an outlet or charging station to charge.
 	Plug-in Hybrid Electric Vehicle	Runs on an electric motor powered by electricity from an external electric source, in addition to support from an internal combustion engine. The vehicle battery can be recharged by plugging into an outlet or charging station as well as through a gas-powered alternator and / or by regenerative braking.

What is Electric Mobility?

In the scope of this Strategy, electric bikes and scooters are also considered as a viable and sustainable form of active transportation.

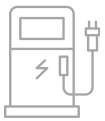
Hydrogen fuel cells are emerging low carbon transportation technologies to monitor and assess as technology and infrastructure advance.

Types of Electric Vehicles and E-Micro Mobility Options		
	Electric Bike	A two or three wheeled cycle with a seat, pedals and an electric motor. The bike can be operated by pedalling or is propelled by the electric motor.
	Electric Cargo Bike	An electric-powered bike with a platform or box to carry larger items like packages and boxes for deliveries. The bike can be operated by pedalling or is propelled by the electric motor.
	Electric Scooter	A two wheeled stand up kick or push scooter that is propelled and powered by an electric motor built in the front or rear wheel.

Electric Vehicle Charging Infrastructure

There are three common types of EV chargers.

The charging times for each type varies according to the vehicle battery size.

Types of Electric Vehicle Chargers		
	Level 1 (120 V)	Uses a standard household outlet to fully charge in 8 – 20 hours. One hour of charging provides approximately 8 km of driving range and is the slowest speed of charging.
	Level 2 (220 V)	Uses a system similar to that of a dryer or stove to fully charge in 4 – 6 hours. One hour of charging provides approximately 30 km of driving range and is the most common charger installed in homes and public charging locations.
	Level 3 (480 V)	Also know as “DC Fast Charger” and provides 80% charge in under an hour for most EVs. One hour of charging provides approximately 300 km of driving range and is typically installed along highways and public charging locations.

Benefits of Electric Mobility

Electric mobility is a sustainable transportation alternative that plays a significant role in reducing GHG emissions from the transportation sector in Burlington. Other benefits of electric mobility include:

- Increased affordability – costing less to charge than fuelling at a gas station.
- Life cycle cost savings – lower maintenance costs.
- Improved air quality due to the reduction in tailpipe emissions.
- Reduced noise pollution.
- Health benefits of increased exercise associated with the use of electric bikes.
- Local economy and job creation.

Switching personal use vehicles to electric in Burlington is expected to result in approximately 5,591 ktCO2e (equivalent Kilotonnes carbon dioxide) in cumulative emissions reductions by 2050[7].

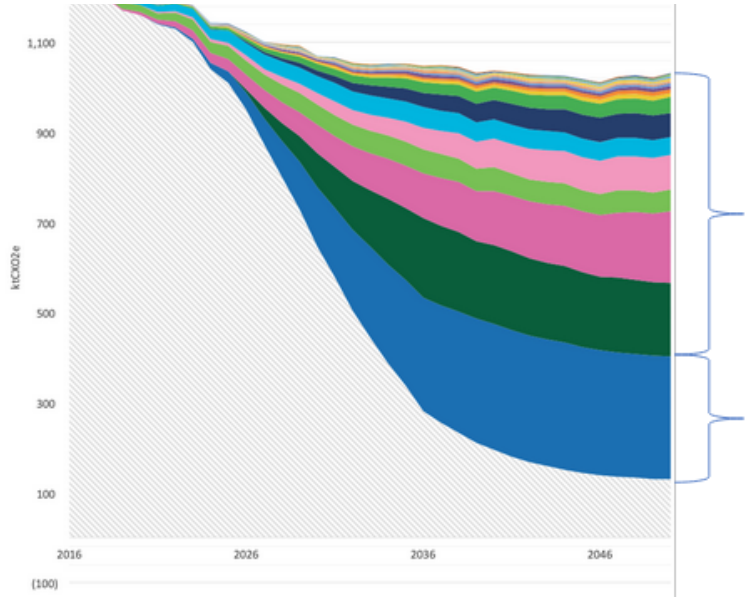


Fig 3: Emission Reductions by Action from 2016 Baseline - Burlington

Electric Mobility in Canada

Canada has signalled a strong commitment to fighting climate change through its enhanced Paris Agreement target to reduce emissions by 40-45% from 2005 levels by 2030 and achieve net-zero emissions by 2050[8]. At the federal level, there is strong support for a shift to electric mobility as one of the key actions to reduce GHG emissions from the transportation sector; the second largest contributor of overall GHG emissions, currently accounting for 25% of Canada's emissions[9].

EVs are gaining popularity in Canada, representing 1 out of 20 new vehicles registered in 2021. The ZEV market share increased from 3.8% in 2020 to 5.6% in 2021[10] and 8.3% in the first quarter of 2022[11].

The 2022 federal budget[12] allocated several funding streams and investments to support the electrification of personal vehicles including:

- $1.7 billion to extend the ZEV sales rebates for three years[13].
- $400 million for 50,000 new ZEV chargers across Canada[14].
- $500 million from the Canada Infrastructure Bank in large-scale ZEV charging infrastructure[15].

In addition to these budget allocations, Canada's 2030 Emissions Reduction Plan[16] committed to developing a light duty vehicles ZEV sales mandate of 100% by 2035 and mandatory interim targets of at least 20% light duty vehicles for sale by 2026 and 60% by 2030.

iZEV Program as of 2022	
Vehicle Type	**Rebate ($)**
Battery-electric	Up to $5,000
Hydrogen fuel cell	Up to $5,000
Plug-in hybrid with an electric range equal to or greater than 50 km	Up to $5,000
Plug-in hybrid with an electric range under 50 km	Up to $2,500
Please visit the iZEV Program website for more information on eligible vehicles including Manufacturer's Suggested Retail Price (MSRP) criteria.	

Electric Mobility in Ontario

Ontario lags behind other Canadian jurisdictions in EV penetration rates. The ZEV market share in Ontario was 3.3% in 2021[17], well below the 5.6% national average. From a volume standpoint, there are 75,274 EVs registered in Ontario[18] and it is expected that by 2030, one out of every three vehicles sold in Ontario will be electric and there will be over one million EVs on the road.

The 2022 Ontario Budget allocates $91 million to expanding electric charging infrastructure across the province[19]. The provincial government is also introducing the Rural Connectivity Fund to support the installation of EV chargers in rural communities and is assessing options to implement a new ultra low overnight electricity rate to help support EV adoption.

Other provincial actions to advance electric mobility include:

- **Providing green licence plates[20] for eligible low-carbon vehicles in high occupancy vehicle (HOV) lanes with any number of occupants and high occupancy toll (HOT) lanes on 400-series highways and the QEW.**
- **Launching the Ontario Vehicle Innovation Network (OVIN)[21]; a flagship program with a $56.4 million investment to drive innovation and investment across Ontario's electric, connected and autonomous vehicle sector.**
- **Amending the Highway Traffic Act by adding the Reserved Parking for Electric Vehicle Charging Act[22] that imposes fines for parking a non-electric vehicle in an EV spot or parking an EV while not charging.**

Electric Mobility in Burlington

There are approximately 1,843 EVs registered in Burlington, representing approximately 2.5% of all EVs registered in Ontario[23].

EV registration is growing year over year, signalling a strong appetite for electric mobility in the community.

There are currently 114 publicly accessible charging station ports[24] in Burlington and growing.

Fig 4: ZEV Growth in Burlington

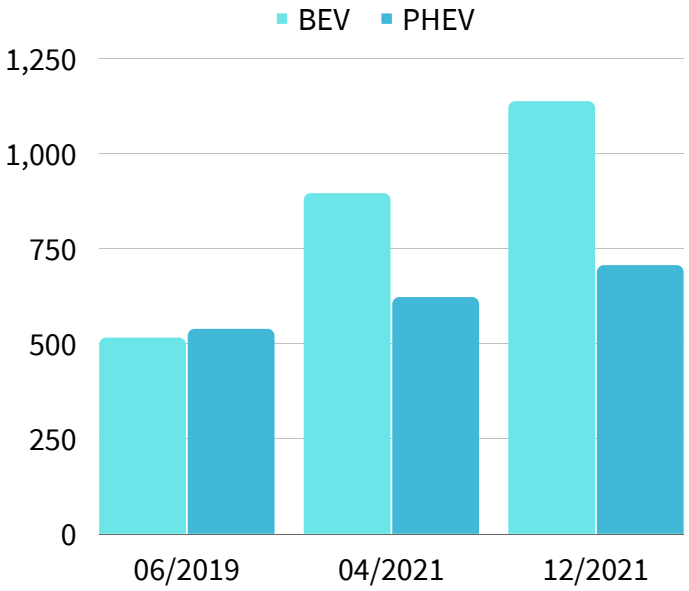


Fig 5: ZEV Registration in Burlington

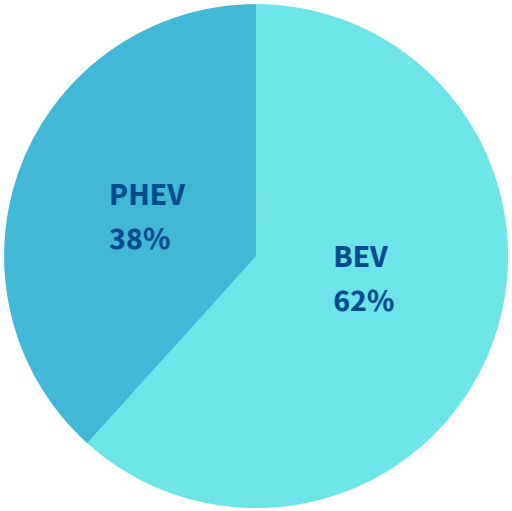
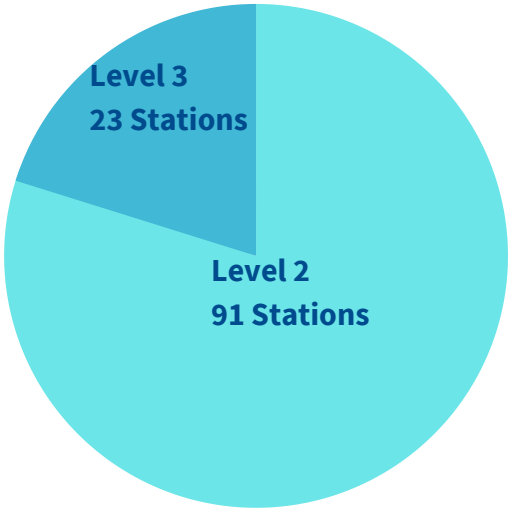


Fig 6: Charging Network in Burlington



Barriers to Electric Mobility Adoption in Burlington

EV ownership is on the rise in Burlington. However, there are several challenges to the wide-scale adoption necessary to achieve the Climate Action Plan's vehicle electrification milestones:

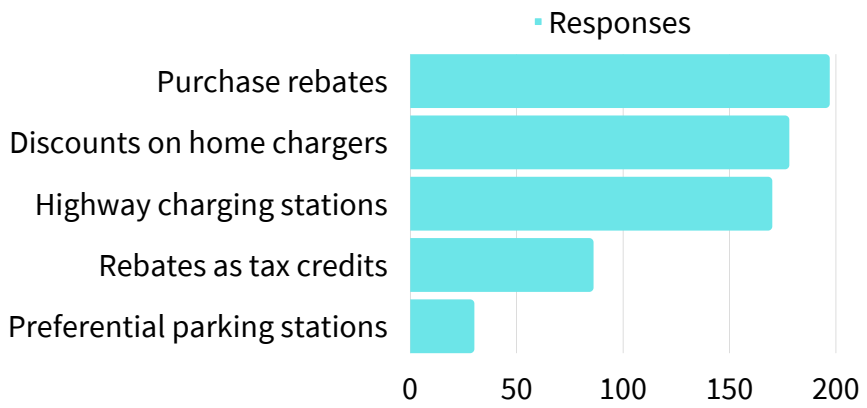
Limited Supply of EVs at Local Dealerships

Across Canada, 67% of dealerships do not have any EVs available in stock, and 24% of dealerships have three EVs or fewer available. Only 9% of dealerships have four EVs or more[25]. Provinces with a ZEV mandate in place have more EV stock, with British Columbia and Quebec leading over the rest of the country. The limited supply of locally accessible EVs makes it more challenging for potential buyers, often times there's limited opportunity to test drive an EV and there are long wait lists for EV deliveries.

Price of EVs

The upfront cost of an EV is currently more expensive than gasoline cars but lifecycle costs have been shown to be lower. 50% of the EV community survey respondents who do not drive an EV indicated that they would be willing to pay up to 10% for an EV with the same functionality as a gas car, and 24.2% are not willing to pay a higher price at all. Incentives continue to play a role in supporting and enabling Canadians to switch to EVs. Survey respondents also indicated that rebates at the time of purchase was their top choice of government programs likely to increase their interest in purchasing an EV in the future. As uptake increases and the market matures, price parity will be reached, gradually eliminating the need for government incentives.

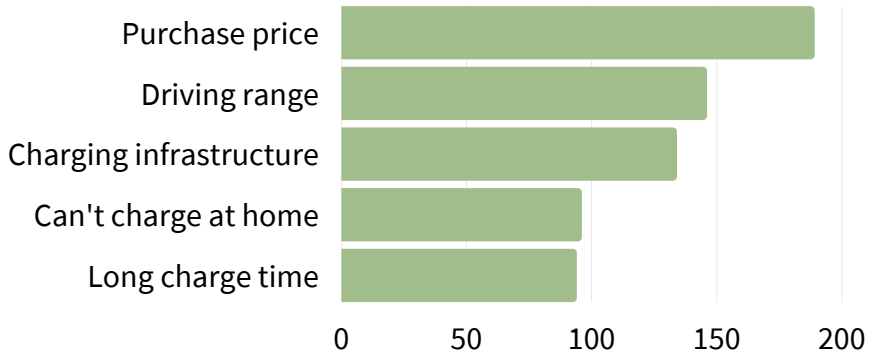
Fig 7: Government programs to encourage purchase of an EV



Access to Charging

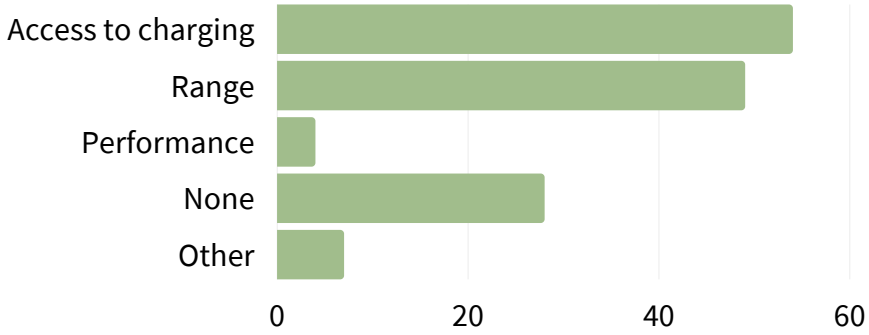
Lack of access to home charging is perceived as one of the most significant barriers to higher EV uptake in Burlington and one of the main ownership challenges that EV owners face. The high cost of charging installations in existing multi-unit residential buildings is one of the biggest challenges to higher EV uptake. A recent federal survey found that 42% of EV drivers that live in multi-unit residential buildings rely on the public charging network[26]. Strengthening "EV Ready" requirements in new developments will avoid the need for expensive future retrofits[27].

Fig 8: What is holding you back from driving an EV?



Range anxiety is also a contributing factor. Vehicle range was the second highest ownership challenge among EV survey respondents who drive an EV, and was the second highest factor, after price that was holding non EV owners from purchasing one. Access to a multitude of charging solutions is necessary to encourage higher EV uptake in the community.

Fig 9: Top EV Ownership Challenges



Barriers to Electric Mobility Adoption in Burlington

Lack of Awareness

Lack of awareness and education about electric mobility options is a barrier to higher uptake. Recent research[28] indicates that Canadians have “mixed views” and a lack of knowledge about EVs. 66% of Canadians surveyed have never driven or been a passenger in an EV. While the Burlington community survey results indicate a higher awareness of EVs among residents, with 100% of survey respondents indicating they have some degree of knowledge of EVs, research indicates that a lack of awareness is widespread across a multitude of electric mobility topics including range anxiety, the availability of public charging infrastructure, other forms of electric mobility (such as electric bikes and electric scooters) and information about purchase rebates.

Grid Capacity

Ensuring adequate grid capacity is critical to a successful transition to electric mobility in the community. As demand for electricity increases, the current grid capacity constraints will pose a significant challenge. It is expected that electricity demand in Canada will increase as all sectors of the economy decarbonize, most notably space heating and on-road transportation[29]. It is projected that Canada's electricity generation capacity needs to increase by 2.2 to 3.4 times by 2050 to meet demand as all sectors of the economy transition to meet their emissions reduction goals.[30] Local distribution companies are faced with the limitations of current grid capacities and an increasing rate of decarbonization.

Opportunities for Higher Electric Mobility Adoption in Burlington

In addition to the ambitious federal EV sales targets, there are several opportunities for higher electric mobility adoption in the community:

A Community Supported Climate Action Plan

The Climate Action Plan for Burlington sets an overarching goal of community carbon neutrality by 2050 and provides carbon reduction targets specific to the transportation section. The plan also includes vehicle electrification targets milestones, providing a springboard for this strategy and signals a strong commitment from City Council to support higher electric mobility uptake in the community.

An Expanding Rollout of EVs from Auto Manufacturers

While there is a current EV shortage in Ontario due to global supply chain challenges and the absence of a provincial ZEV mandate, it is expected that EV models will increase over time. Most auto manufacturers have indicated a shift to EVs, with the number of EV models increasing to 370 models globally in 2020[31] and growing. Ontario is also building its EV production and battery manufacturing capacity, contributing to a strong local EV industry[32].

Support from the Local EV Industry

There is evidence that some local dealerships are preparing for the future by ensuring that their facilities have the necessary infrastructure to support EVs, and staff training to improve sales and service. There is also healthy competition between EV charger supply companies and installers to service the needs of Burlington residents and businesses. Many of these businesses are supportive of community engagement activities to help accelerate the adoption of EVs in Burlington.

Opportunities for Higher Electric Mobility Adoption in Burlington

A Growing Local EV Culture

There is a growing interest and enthusiasm for electric mobility in Burlington. Local EV ambassadors and organizations play a significant role in advancing electric mobility and supporting electric mobility initiatives. Local EV ambassadors are an important factor in the success of local EV events, providing an opportunity for the community to ask questions and hear relevant experiences.

Active Transportation and Modal Splits

Higher adoption of integrated mobility, modal splits and active transportation, electrification of transit and increased uptake of electric mobility will all play a role in achieving the target emissions reductions from the transportation sector. Electric bikes and scooters will also play a role, as efficient and relatively affordable low carbon mobility options for Burlington residents. This is an emerging area, particularly as more people consider active transportation options. The growth in adoption of these sustainable alternatives will be dependent on the implementation of the Integrated Mobility Plan and safe and efficient cycling infrastructure.

2022 Burlington Plug N Drive Event:

"Great, knowledgeable staff who answered all my questions, recommended experience."

"It was helpful to learn more about EVs and to feel more comfortable about buying one."

"Excellent experience all around from the vehicle to the advisor."

"Great to have the opportunity to drive the EV cars. Thank you."

"Fantastic, I would highly recommend this to my neighbours and friends. I had no idea the power and smooth operation of the vehicle. I will now look at an electric vehicle for my next purchase."

The City's Commitment to Advance Electric Mobility

City actions to advance electric mobility in Burlington include[33]:

- 28 Level 2 charging stations with a total of 54 charging heads, with 10 more installations planned in 2022.
- 1 Level 3 charging station – to be installed in the downtown area with more opportunities to be explored.
- Transitioning to a green fleet with 50 battery electric vehicles (BEVs), hybrid or plug-in hybrid electric vehicles (PHEVs) in service with plans to add more.
- Adding 30 pieces of electrical equipment (mowers, trimmers, leaf blowers).
- Completing the automatic vehicle locator (AVL) installation on all corporate vehicles. This provides the ability to monitor vehicle use and idle information more accurately to determine corrective actions and update driver training requirements.
- Hosting electric mobility events in partnership with other stakeholders.

The City is committed to achieving the transportation carbon reduction targets of the Climate Action Plan and showing leadership through the implementation of the Corporate Energy and Emissions Management Plan for City operations.

The Corporate Green Fleet Strategy will be developed by the end of 2022, where electric mobility will be a key part of greening the City's fleet. The development process will review current and future industry trends and technology and allow the City to develop a more detailed vehicle and equipment replacement strategy. The study will focus on reducing overall GHG emissions in order to help meet the City's goal of corporate carbon neutrality by 2040.

The City is also working to expand the installation of public electric charging infrastructure on City property.

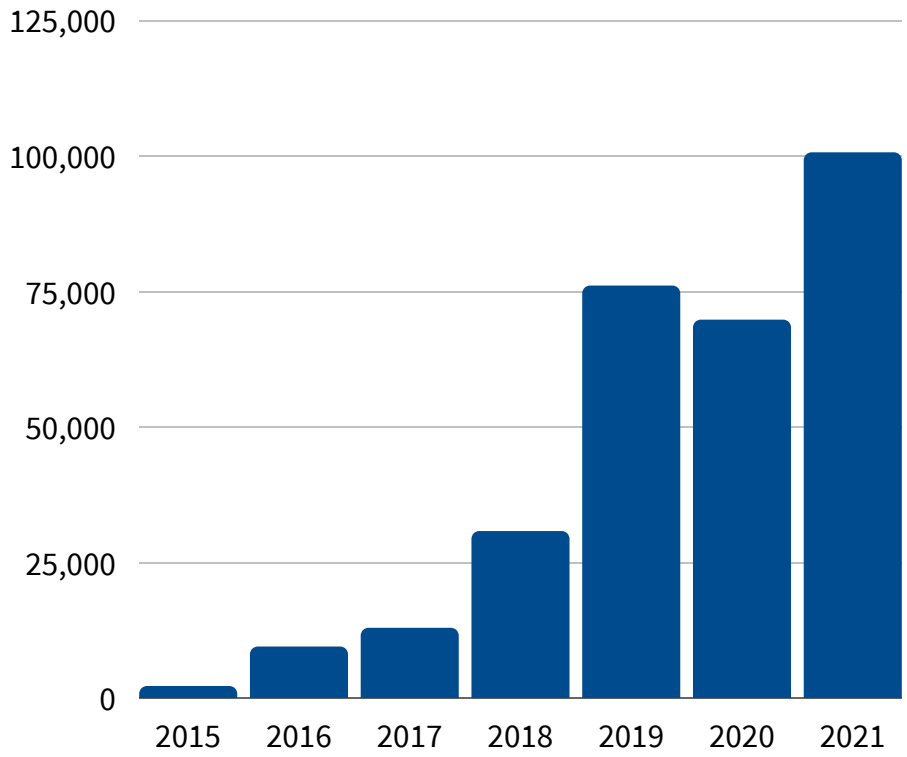
The City's Commitment to Advance Electric Mobility

To date, the City is offering free charging at all public charging stations (however, parking fees may apply on weekdays depending on parking lot location and time of day). As the charging infrastructure expands, consideration must be given to the resources required to manage it and the City may explore opportunities to recover operational costs including a fee structure at public charging stations.

The utilization rate of the City's public charging infrastructure continues to grow, with 2021 seeing a 24% increase over 2019.

The location of public and private chargers in Burlington can be accessed via a variety of applications and tools including Natural Resources Canada's Electric Charging and Alternative Fuelling Stations Locator.

Fig 10: Total Utilization (kWh/yr) of City Owned Chargers



Community and Stakeholder Engagement

The Burlington community, various stakeholders and City staff were engaged during the strategy development phase to inform actions to advance electric mobility in the community and to ensure that these actions reflect the community's transportation needs and preferences.

Engagement opportunities included:

Public Engagement

- Three community surveys focused on:

Plug-in electric vehicles

Electric bikes

Electric scooters

The surveys gathered information on the public's perspective and experiences on different aspects:

- Barriers and opportunities to higher electric mobility adoption.
- Ownership challenges.
- Charging needs and preferences.
- The role of electric bikes and electric scooters.
- The role of government and individuals in accelerating electric mobility adoption.

- Plug'n Drive's MEET - Mobile Electric Vehicle Education Trailer providing EV test drives, EV resources and a chance to meet EV ambassadors in the community for a month long period in the spring of 2022. This opportunity was sponsored by the City of Burlington and Burlington Hydro.

- A two week public feedback period to provide feedback on the draft strategy actions released on the Get Involved Burlington engagement platform in June of 2022.

Please see the Electric Mobility Strategy Engagement Report for more details.

"Look at total cost of ownership. You'll be surprised at how much you can save."

- "Share your EV Story" participant.

Stakeholder Engagement

- Stakeholder Interviews: with representatives from different City departments, organizations working in the EV realm and the EV supply chain industry.
- Strategy Advisory Committee: comprised of internal and external stakeholders and community members. Three meetings were hosted to solicit feedback and input at different stages of the Strategy development[34].

Community engagement

665 Community survey responses

122 Draft actions survey responses

43 Comments on draft actions

Stakeholder engagement

47 Stakeholders

39 Organizations

39 Interviews & Meetings

Plug N' Drive MEET

16 Days

362 Test drives

203 Appointments

128 Drop-ins

Strategy Actions

Informed by community and stakeholder feedback, in addition to best practices from leading municipalities, the following proposed action areas have been identified to support higher electric mobility uptake in Burlington.

Electric Mobility Strategy Proposed Action Areas

1. CHARGING INFRASTRUCTURE & GRID CAPACITY
2. CITY LEADERSHIP
3. EDUCATION & AWARENESS
4. EQUITY & ACCESSIBILITY

Timelines			
Short Term	**Medium Term**	**Long Term**	**Ongoing**
1 - 2 years timeframe.	2 - 5 years timeframe.	5 - 10 years timeframe.	Already in progress and/or starting immediately and will continue throughout the Electric Mobility Strategy implementation timeframe and beyond.

Role	Definition
Lead	City Department / Service Area / Municipal or Other Partner.
Collaborator	Other internal partner or external organization. The scope of collaboration may include knowledge support and/or financial contribution.

1. Charging Infrastructure and Grid Capacity

A robust public charging infrastructure and a multitude of charging solutions are critical to ensure a smooth transition to electric mobility in the community. Charging solutions that reflect drivers needs and preferences are necessary to accelerate the rate of EV adoption.

Charging demand is outpacing the rate of charging installations, and immediate action is necessary to ensure sufficient and equitable access to charging stations. Burlington has the highest rate of charging stations per capita in the GTHA, with over 30 public stations per 50,000 people[35]. This is still below necessary levels to meet the city's charging needs as electrification targets are met. It is anticipated that one charging station will be needed for every 49 vehicles by 2050[36]. The actions in this section focus on expanding residential and workplace charging solutions.

This section also focuses on actions and planning steps to ensure adequate grid capacity as more EVs are plugged in to charge.

Fig 11: Map of EV Chargers in Burlington
Source: ChargeHub

Strategy Actions

1. Charging Infrastructure and Grid Capacity				
1.1. Residential and Workplace Charging				
	Action	**Lead**	**Collaborator**	**Timeline**
1.1.1	Explore opportunities to amend zoning and parking bylaws to support "EV Ready" requirements in new developments.	Community Planning	Sustainable Development Committee (SDC), Building and Bylaw Department	Medium Term
1.1.2	Develop an "EV Ready" best practice guide for new developments.	Environment & Energy (E&E)	Burlington Electricity Services Inc (BESI), West End Home Builders Association, Community Planning, Transportation Services	Medium Term
1.1.3	Explore opportunities to strengthen "EV Ready" items in Burlington's Sustainable Building and Development Guidelines.	Community Planning	SDC	Medium Term
1.1.4	Encourage multi-residential building owners, management companies or condominium boards to assess the feasibility to upgrade electrical infrastructure where required to support EV charging.	E&E	Condo Corporations, Property Management Companies, EV Charging Contractors / Suppliers	Short Term

1. Charging Infrastructure and Grid Capacity (continued)				
1.1. Residential and Workplace Charging (continued)				
	Action	**Lead**	**Collaborator**	**Timeline**
1.1.5	Support homeowners with installation of EV chargers through the HERO (Home Energy Efficiency Retrofit) program.	E&E	Non-Government Organizations (NGOs), EV Charging Contractors/Suppliers	Medium Term
1.1.6	Explore opportunities to support workplace charging.	E&E	Burlington Economic Development (BED), Chamber of Commerce, EV Charging Contractors / Suppliers	Medium Term

1. Charging Infrastructure and Grid Capacity (continued)				
1.2. Public Charging Network				
	Action	**Lead**	**Collaborator**	**Timeline**
1.2.1	Conduct an EV public charging network gap analysis to identify opportunities to increase and prioritize EV chargers on City property, including: a) Assess and explore opportunities for publicly accessible community charging hubs in locations where home charging is not feasible. b) Prioritize the installation of DC fast chargers (Level 3) in City lots.	E&E	Transportation Services, Fire, Roads, Parks and Forestry, Recreation, Community and Culture, External Funding Agencies	Short Term
1.2.2	Explore opportunities to partner with the private sector to expand the public charging network.	E&E	EV Charging Contractors / Suppliers	Short Term
1.2.3	Engage Halton Region to support regional charging coverage.	E&E	Halton Region	Medium Term

1. Charging Infrastructure and Grid Capacity (continued)				
1.3. Grid Capacity				
	Action	**Lead**	**Collaborator**	**Timeline**
1.3.1	Work with Burlington Hydro to assess the impact of increased demand on the grid and determine the best strategies to mitigate.	E&E	Burlington Hydro	Short Term
1.3.2	Monitor emerging technologies with potential partners for consideration as pilot projects.	E&E	EV Charging Contractors / Suppliers, Others as Identified	Long Term
1.3.3	Collaborate with Burlington Hydro to assess EV ownership data and identify neighbourhoods where the local distribution grid requires upgrading to ensure support for increased EV ownership and charging.	E&E	Burlington Hydro	Short Term
1.3.4	Partner with Burlington Hydro to set up a process to encourage/incent homeowners to advise when they have installed a charger.	E&E	Burlington Hydro, Corporate Communications and Engagement	Short Term
1.3.5	Support and advocate to the Province for the implementation of an ultra-low overnight rate.	Burlington Hydro	E&E	Short Term

2. City Leadership

The community engagement EV survey findings indicate that the City has a major role to play in addressing climate change and is perceived as a trusted source of information. The actions in this section focus on City actions that support electric mobility through advocacy, growing the local EV market and leading by example.

Advocating for policies that support residents in switching to electric mobility is an opportunity for City leadership. Policies that spur supply of EVs such as a provincial ZEV mandate, continued federal price rebates and advocating for "EV Ready" requirements in new developments are among the top advocacy priorities. A robust and dynamic local EV market will support and accelerate the transition to electric mobility in the community.

Increasing the availability and access to a multitude of electric mobility options (such as electric bikes and electric scooters) through incentives and attracting EV ride share programs will help grow a local EV market. The City of Burlington owns and manages a growing portfolio of electric mobility assets, presenting an opportunity to lead the transition in the community and reduce corporate GHG emissions. Updating the City's Green Fleet Strategy will ensure proper planning is in place to fully electrify the corporate fleet and identify any gaps in staff training needs to operate and maintain the electric fleet.

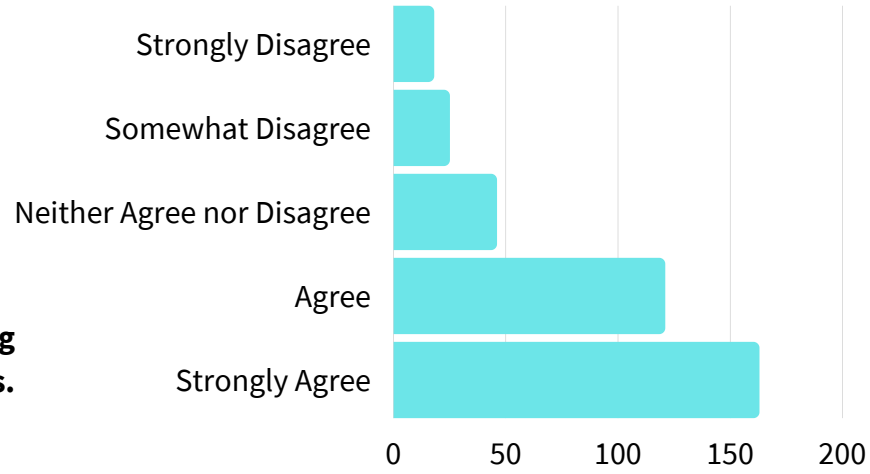


Fig 12: The City of Burlington is responsible for addressing climate change in its plans and programs.

2. City Leadership				
2.1. Advocacy				
	Action	**Lead**	**Collaborator**	**Timeline**
2.1.1	Advocate for a ZEV mandate at the provincial level to spur the supply of EVs.	E&E	Community groups / NGOs	Ongoing
2.1.2	Advocate for continued incentives at the federal level and reinstating incentives at the provincial level.	E&E	Community groups / NGOs	Ongoing
2.1.3	Share knowledge and experience with federal and provincial EV working groups to guide policy direction.	E&E	Burlington Hydro, Community Planning, NGOs	Ongoing
2.1.4	Advocate to higher levels of government for policy to attract EV and EV battery manufacturing to Ontario to strengthen and support the local EV industry.	Halton Region Economic Development	BED, Community groups / NGOs	Ongoing
2.1.5	Advocate for “EV ready” requirements / standards in new developments.	E&E	SDC, Community Planning	Ongoing

2. City Leadership (continued)				
2.2. Support the Local EV and E-Micro Mobility Market				
	Action	**Lead**	**Collaborator**	**Timeline**
2.2.1	Continue efforts to attract car-sharing and bike-sharing operators to Burlington and explore opportunities for them to increase the percentage of EV and / or e-bikes in their fleets.	Transportation Services	Community Planning	Long Term
2.2.2	Explore the feasibility of a bulk EV purchase program with other municipalities for the City fleet through the regional purchasing co-operative.	Roads, Parks and Forestry	Finance	Short Term
2.2.3	Assess the feasibility of e-bike / e-scooter public charging (outdoor outlets) at strategic locations, with the co-benefit and consideration of accessibility standards for mobility scooters.	E&E	Transportation Services, Engineering Department, Recreation, Community and Culture	Long Term
2.2.4	Explore opportunities to provide secure parking for micro mobility on city property. Encourage other organizations and businesses to consider providing secure parking for micro mobility.	E&E	Transportation Services, Engineering Department	Long Term

2. City Leadership (continued)				
2.3. City Fleet				
	Action	**Lead**	**Collaborator**	**Timeline**
2.3.1	Accelerate the rate of electrification of the City's fleet and equipment.	Roads, Parks and Forestry	Fire, Transit	Ongoing
2.3.2	Update the Green Fleet Strategy.	Roads, Parks and Forestry	E&E, Fire, Transit	Short Term
2.3.3	Conduct a gap analysis to identify opportunities for staff training as the fleet transitions to full electric vehicles and equipment.	Roads, Parks and Forestry	Fire, Transit	Short Term

3. Education and Awareness

This is an area that represents one of the greatest opportunities for local action to accelerate the uptake of electric mobility in Burlington through the establishment of an Electric Mobility Hub.

Providing hands on opportunities to experience electric mobility options and charging technologies is one of the most effective ways to gain community support for electric mobility. The City of Burlington has a track record of hosting successful EV events with local partners to offer EV test drives, charging technologies showcase and a chance to meet EV ambassadors in the community. These events have proven to be successful, with almost 85% of the 2022 MEET Burlington event attendees surveyed indicating that they are “more likely to buy an EV after their test drive experience.”

The City also has an opportunity to leverage its growing electric mobility assets to spread awareness and knowledge through engaging and educational signage strategically located at public charging stations and branding the City’s fleet.

This section focuses on actions that spread awareness and knowledge, leading to better driver experiences and increased support for electric mobility.

Fig 13: MY EV Story Campaign

3. Education and Awareness				
	Action	**Lead**	**Collaborator**	**Timeline**
3.1.1	Ensure that public chargers in municipal lots are clearly marked with attractive and informative signage.	E&E	Corporate Communications and Engagement, Transportation Services, Roads, Parks and Forestry	Short Term
3.1.2	Brand the City's electric fleet.	Roads, Parks and Forestry	Corporate Communications and Engagement	Short Term
3.1.3	Establish an “Electric Mobility Hub”; a one stop shop for EV resources and support. Assess the feasibility of an EV Showcase as a component of the Hub.	E&E	Community Groups / NGOs, Corporate Communications and Engagement, Burlington Hydro	Short Term
3.1.4	Continue to collaborate with community and EV organizations to plan and host electric mobility events.	E&E	Community Groups / NGOs, Corporate Communications and Engagement, Burlington Hydro	Ongoing

3. Education and Awareness (continued)				
	Action	**Lead**	**Collaborator**	**Timeline**
3.1.5	Engage the development community and realtors to include “EV Ready” features in real estate listings.	E&E	Corporate Communications and Engagement, Community Planning	Short Term
3.1.6	Explore opportunities to collaborate with the private and non profit sector to deliver educational programs on low carbon transportation modes, including e-bikes and e-scooters.	Transportation Services	Community Groups / NGOs, Burlington Cycling Advisory Committee, EV Industry	Ongoing

4. Equity and Accessibility

To ensure an equitable transition to electric mobility in the community, the barriers to higher adoption in underrepresented communities must be addressed. The community survey findings indicate there is concern among survey respondents over equitable access to charging infrastructure.

Equitable and accessible design and distribution of the public charging infrastructure across the city must be top of mind to address existing gaps. Additionally, price barriers are more significant in vulnerable communities even with life cycle cost benefits of electric mobility. There are potential opportunities to provide more affordable and sustainable electric mobility options such as electric bikes and electric scooters, with incentive programs.

This section focuses on actions that ensure equitable access to charging infrastructure and electric mobility resources.

Comments from survey respondents about equity and accessibility concerns:

"Standards need to be developed to create accessible (Electric Vehicle Charging Stations) EVCS and parking spaces because people with disabilities also need to charge their electric vehicles."

"If you are in a wheelchair, you can not plug the vehicle in."

"Burlington's EVs must include the mobility scooters that our handicapped and seniors must use on a regular basis to enjoy a barrier free community."

"Electric bikes are a great option for those that cannot afford an EV. However, the City has to be bike friendly in order for people to adopt it."

4. Equity and Accessibility				
	Action	**Lead**	**Collaborator**	**Timeline**
4.1.1	Prioritize the location of City owned EV chargers to ensure equitable distribution on City property across the community and with consideration of accessible design standards.	E&E	Transportation Services, Engineering Department, Roads, Parks and Forestry, Fire, Recreation, Community and Culture	Short Term
4.1.2	Explore opportunities to offer incentives for the purchase of electric bikes and electric scooters. Consider criteria to direct incentives to specific sectors of the community (i.e. low income and other vulnerable populations).	E&E	Finance, Transportation Services	Medium Term
4.1.3	Develop engagement campaigns and promotional materials that target underrepresented communities to support their transition to EVs.	E&E	Corporate Communications and Engagement, Community Groups / NGOs	Medium Term

Let's PlugNGo!

The implementation of the strategy recommendations is an opportunity for the City of Burlington to demonstrate leadership in climate action and paves the way to achieve the community carbon neutrality goal. Immediate investments to implement the strategy and the adoption of a collaborative implementation model will support and accelerate the shift to electric mobility in the community.

The establishment of an Electric Mobility Hub is recommended to implement the Electric Mobility Strategy actions. The hub will be comprised of:

I. E-Mobility Community Engagement and Web Resource

Through year-round in person events, a social media engagement campaign, and a “one stop” web EV resource to serve as a centralized digital aggregator of up to date e-mobility information, contacts and resources, helping the community discover the many opportunities and benefits of EVs and e-micro mobility options, thereby accelerating local buy in while providing a smoother transition to EV adoption. Additionally, an annual “EV Showcase” event to be hosted in collaboration with local partners and the EV supply chain, providing test drives, educational resources, and an opportunity to meet EV ambassadors in the community.

II. E-Mobility Resource Group

Comprised of local residents, relevant municipal and local utility staff identified as leads and collaborators in the actions sections of this strategy, in addition to e-mobility and charging infrastructure suppliers, the Resource Group members will collaborate to advance key policy and recommendations of the E-Mobility Strategy to support higher electric mobility uptake.

Reporting and Measuring Success

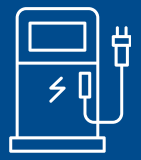
The Electric Mobility Hub will report on the Electric Mobility Strategy's implementation progress in an annual report.

Progress will be measured across the four main action areas and include various metrics such as:

- **The number of EVs registered in Burlington**

- **The number of new public chargers installed**

- **Total number of chargers publicly available**



- **Policy and by-law updates**

- **Updates to the Sustainable Building and Development Guidelines**

- **The number of EV events hosted**

Appendix A: Glossary

Automatic Vehicle Locator (AVL): a device that makes use of the Global Positioning System (GPS) to enable a business or agency to remotely track the location of its vehicle fleet by using the Internet. These devices combine GPS technology, cellular communications, street-level mapping, and an intuitive user interface, with the ostensible goal of improving fleet management and customer service.

Canada Infrastructure Bank: an impact investor deploying $35 billion to develop the next generation of infrastructure Canadians need; delivering outcomes such as sustainable economic growth, connected communities and climate change action.

Environment and Energy (E&E): City of Burlington service area, part of Environment, Infrastructure and Community Services.

E-Micro Mobility: refers to a range of small, light weight vehicles such as e-bikes and e-kick scooters operating at relatively low speeds, with electric assist motors.

Electric Vehicle (EV): is a vehicle that uses electricity from an external charging source to fuel its movement either in whole or in part. Specifically, this means light-duty plug-in hybrid electric vehicles (PHEV) and battery electric vehicles (BEV).

Electric Vehicle (EV) Range: the number of kilometers an electric vehicle can travel on a fully charged battery, or a single charge.

Greenhouse Gas (GHG) Emissions: are gases that trap heat in the atmosphere and cause a change in climate.

GTHA: Greater Toronto and Hamilton Area

High Occupancy Toll (HOT) Lanes: are similar to (High Occupancy Vehicle) HOV lanes (usually referred to as “carpool lanes”) but provide the option for people driving alone to pay a fee to use the lane. Carpooling drivers and certain vehicles can use HOT lanes for free and do not need a permit.

Appendix A: Glossary

Hydrogen Fuel Cells: fuel cells that use the chemical energy of hydrogen or other fuels to cleanly and efficiently produce electricity. If hydrogen is the fuel, the only products are electricity, water, and heat.

Internal Combustion Engine (ICE): a vehicle that is powered by a gasoline or diesel engine.

Net-Zero Emissions: are achieved when anthropogenic CO2 emissions are balanced globally by anthropogenic CO2 removals over a specified period. Net zero CO2 emissions are also referred to as carbon neutrality.

The Paris Agreement: is a legally binding international treaty on climate change. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016.

ZEV: Zero Emission Vehicle

UNESCO: United Nations Education, Scientific and Cultural Organization.

Appendix B: Endnotes

[1] Branching Out – BurlingtonGreen Strategic Plan

[2] Make the Switch – a BurlingtonGreen program that focuses on empowering people to adopt more sustainable options so that together, we can help to create a cleaner, greener, more environmentally responsible Burlington.

[3] Burlington Climate Action Plan. The plan includes seven key program areas to help the community transition away from the use of fossil fuels, particularly for buildings and transportation.

[4] Integrated Mobility Plan for Burlington

[5] Burlington Climate Action Plan. From the electrification of light duty personal and commercial vehicles.

[6] Canadian Urban Transit Research and Innovation Consortium.

[7] Burlington Climate Action Plan. From the electrification of light duty personal vehicles and commercial use vehicles.

[8] Government of Canada – Net-Zero Emissions by 2050.

[9] Government of Canada – Canada's 2030 Emissions Reduction Plan.

[10] IHS Markit – Q4 2021 Year End Report.

[11] Electric Autonomy Canada – Q1 2022 – EV Sales.

[12] Budget 2022 – A Plan to Grow Our Economy and Make Life More Affordable.

[13], [14] - The iZEV program and ZEVIP.

[15] Budget 2022 – A Plan to Grow Our Economy and Make Life More Affordable. Chapter 3.

[16] Government of Canada – Canada's 2030 Emissions Reduction Plan.

[17] Electric Autonomy Canada - Over one in 20 new cars registered in Canada in 2021 were EVs.

[18] Government of Ontario – News release. Ontario Making it Easier to Access Electric Vehicle Chargers.

[19] 2022 Ontario Budget: Ontario's Plan to Build.

Appendix B: Endnotes

[20] Government of Ontario - Green License Plate Program.

[21] The Ontario Vehicle Innovation Network.

[22] Government of Ontario - Reserved Parking for Electric Vehicle Charging Act.

[23] Source: Ministry of Transportation – Ontario (as of Dec 2021)

[24] ChargeHub – Charging stations in Burlington

[25] Dunsky Consulting - Plug In Electric Vehicle Availability Report.

[26] Pollution Probe - Assessment of the Consumer Electric Vehicle Charging Experience in Canada.

[27] Clean Air Council - Final Electric Vehicle Costing Study and Performance Requirements Study.

[28] Natural Resources Canada - Canadians' Awareness, Knowledge and Attitudes Related to Zero Emission Vehicles (ZEVs).

[29] Government of Canada - 2030 Emissions Reductions Plan.

[30] Canadian Climate Institute - The Big Switch Report.

[31] IEA, 2021. Global EV Outlook 2021.

[32] Government of Ontario - Driving Prosperity: The Future of Ontario's Automotive Sector.

[33] Information on electric vehicle chargers and the corporate fleet are up to date at the time of finalizing this document and are subject to change.

[34] Please see Appendix C for a list of Stakeholders engaged in the strategy development process.

[35] The Atmospheric Fund - How this small Ontario city is leading on public EV charging.

[36] CBC News - Canada needs to build millions — not thousands — of EV charging stations.

Appendix C: List of Stakeholders

1. Bay Area Climate Change Council (BACCC)*
2. Burlington Community Climate Action Hub (BCCAH)
3. Burlington Climate Action Plan Stakeholder Committee
4. Burlington Chamber of Commerce
5. Burlington Economic Development*
6. ChargePoint
7. Charger Crew
8. City of Brampton
9. Burlington Hydro*
10. Burlington Integrated Transportation Advisory Committee (ITAC)
11. City of Burlington - Community Planning*
12. City of Burlington - Environment and Energy*
13. City of Burlington - Finance
14. City of Burlington - Roads, Parks and Forestry*
15. City of Burlington - Transit Services
16. City of Burlington - Transportation Services (Integrated Mobility Plan)*
17. City of Burlington - Mayor
18. City of Burlington - Ward 1 Councillor
19. City of Burlington - Ward 2 Councillor
20. City of Burlington - Ward 3 Councillor
21. City of Burlington - Ward 4 Councillor
22. City of Burlington - Ward 5 Councillor
23. City of Burlington - Ward 6 Councillor
24. City of Mississauga
25. Clean Air Partnership*
26. Emshih Developments
27. Electric Autonomy Canada
28. EV Direct
29. EV Society*
30. Flo
31. Halton Region*
32. Leggat Chevrolet Cadillac Buick GMC Limited
33. Mercedes Burlington
34. Ontario Ministry of Transportation
35. Peel Region
36. Pride Consulting
37. Private Electrician
38. Rechargeables
39. Shift EV
40. Spokes N Slopes
41. Sustainable Hamilton Burlington
42. The Atmospheric Fund (TAF)*
43. Tesla
44. Westend Home Builders' Association*

*Serves on the Electric Mobility Strategy Advisory Committee

Appendix D: List of Figures